General

Guideline Title

ACR Appropriateness Criteria® single brain metastasis.

Bibliographic Source(s)

Vassil AD, Videtic GMM, Gore EM, Bradley JD, Buatti JM, Germano I, Ghafoori AP, Henderson MA, Lutz ST, Murad GJA, Patchell RA, Patel SH, Robbins JR, Robins HI, Wippold FJ II, Yunes MJ, Expert Panel on Radiation Oncology-Brain Metastasis. ACR Appropriateness CriteriaÂ® single brain metastasis. [online publication]. Reston (VA): American College of Radiology (ACR); 2012. 9 p. [37 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Suh JH, Gaspar LE, Videtic GM, Aref AM, Germano I, Goldsmith BJ, Imperato JP, Marcus KJ, McDermott MW, McDonald MW, Patchell RA, Robins HI, Rogers CL, Wolfson AH, Wippold FJ II, Expert Panel on Radiation Oncology-Brain Metastases. ACR Appropriateness Criteria® single brain metastasis. [online publication]. Reston (VA): American College of Radiology (ACR); 2010. 8 p.

Recommendations

Major Recommendations

ACR Appropriateness Criteria®

Clinical Condition: Single Brain Metastasis

Variant 1: 77-year-old man, PET scan demonstrated widely metastatic melanoma with a 2 cm right thalamic lesion. Patient is symptomatic. Neurosurgeon believes surgery would be high risk. KPS 60. Patient refuses further systemic therapy.

Treatment	Rating	Comments
Focal Therapy Alone		
Stereotactic radiosurgery (SRS) alone	7	Considerable debate regarding role of SRS for patient with KPS of 60. Some felt SRS alone provided quicker palliation compared to WBRT.
Surgical resection alone	1	
Whole Brain RT (WBRT) Alone		
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate		

Treatment	Rating	Comments
2000 cGy/5 fractions	7	Debate regarding role of this fractionation scheme. Given low KPS and patient refusal for further systemic therapy, short fractionation is deemed appropriate.
3000 cGy/10 fractions	8	
3750 cGy/15 fractions	5	Did not favor more prolonged WBRT schedule.
4000 cGy/20 fractions	1	
Combination Therapy		
SRS + WBRT	3	Aggressive therapy for patient with short life expectancy.
Surgery + WBRT	1	
Surgery + SRS to resection cavity	1	
Observation	6	Consider steroids and hospice care.
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 2: 54-year-old man found to have widespread metastatic small cell carcinoma to lung, bone, and liver by PET/CT imaging, with a 2 cm asymptomatic left anterior temporal lobe lesion. KPS 70. Systemic therapy is planned. No prior WBRT.

Treatment	Rating	Comments
Focal Therapy Alone		
Stereotactic radiosurgery (SRS) alone	2	
Surgical resection alone	1	
Whole Brain RT (WBRT) Alone		
2000 cGy/5 fractions	5	
3000 cGy/10 fractions	8	
3750 cGy/15 fractions	8	
4000 cGy/20 fractions	2	
Combination Therapy		
SRS + WBRT	2	Considered too aggressive for radiosensitive tumor.
Surgery + WBRT	1	
Surgery + SRS to resection cavity	1	
Observation	1	
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 3: 68-year-old woman who received chemotherapy/radiotherapy and surgery for esophageal carcinoma. No evidence of extracranial disease. A 5 cm lesion in right anterior frontal lobe with 15 mm midline shift. KPS 90 on high-dose steroids.

Treatment	Rating	Comments
Focal Therapy Alone		
Stereotactic radiosurgery (SRS) alone	1	
Surgical resection alone	2	
Whole Brain RT (WBRT) Alone		
2000 cGy/5 fractions	1	
3000 cGy/10 fractions	5	Consider if patient refuses surgery or is medically unfit for surgery.
3750 cGy/15 fractions	5	Consider if patient refuses surgery or is medically unfit for surgery.
4000 cGy/20 fractions	1	
Combination Therapy		
SRS + WBRT	1	
Surgery + WBRT	9	
Surgery + SRS to resection cavity	2	
Observation	1	
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 4: 48-year-old man who received left upper lobe resection for NSCLC one year earlier, now with 3 cm right frontal lobe lesion. No clinical or radiographic evidence of extracranial disease. The right frontal lesion was completely resected, confirmed by contrast MRI scan 24 hours after surgery. Two weeks after surgery, KPS is 80.

Treatment	Rating	Comments
Focal Therapy Alone		
Stereotactic radiosurgery (SRS) alone	5	No phase III trial demonstrating superiority over WBRT.
Whole Brain RT (WBRT) Alone		
2000 cGy/5 fractions	1	
3000 cGy/10 fractions	7	
3750 cGy/15 fractions	7	
4000 cGy/20 fractions	4	
Combination Therapy		
SRS + WBRT	1	
Observation	1	
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 5: 35-year-old woman with metastatic breast cancer to multiple bony sites with a 3 cm left parietal lesion. Systemic disease is no longer responding to chemohormonal therapy. Surgical resection was subtotal in nature, confirmed by postoperative MRI. KPS 90.

Treatment	Rating	Comments
Focal Therapy Alone		
Stereotactic radiosurgery (SRS) alone	6	Concern that patient may live long enough to develop other brain metastases without use of WBRT.
Surgical resection (repeat)	2	
Whole Brain RT (WBRT) Alone		
2000 cGy/5 fractions	3	
3000 cGy/10 fractions	8	
3750 cGy/15 fractions	8	
4000 cGy/20 fractions	3	Prolonged course of WBRT is discouraged.
Combination Therapy		
SRS + WBRT	8	Since patient had subtotal resection, some recommend combination approach to maximize local control.
Surgery + WBRT	1	
Surgery + SRS to resection cavity	1	
Observation	1	
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 6: 49-year-old woman (nonsmoker) recently diagnosed with 2 cm NSCLC left upper lobe with no hilar and mediastinal lymphadenopathy, and asymptomatic 2 cm right frontal lesion. Abdominal CT and bone scan were negative. KPS 90.

Treatment	Rating	Comments
Focal Therapy Alone		
Stereotactic radiosurgery (SRS) alone	7	
Surgical resection alone	5	
Whole Brain RT (WBRT) Alone		
2000 cGy/5 fractions	1	
3000 cGy/10 fractions	5	
3750 cGy/15 fractions	5	
4000 cGy/20 fractions	1	
Combination Therapy		
SRS + WBRT	8	
Surgery + WBRT	1	
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate		

Treatment	Rating	Comments
Surgery + SRS to resection cavity	5	More data is needed for SRS to resection cavity.
Observation	1	
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 7: 42-year-old woman who had nephrectomy for renal cell carcinoma six years earlier with a 1 cm lesion in the right lateral cerebellum found incidentally after MRI for head injury. Stereotactic biopsy was consistent with renal cell carcinoma. CT of chest/abdomen and bone scan was negative. KPS 90.

Treatment	Rating	Comments
Focal Therapy Alone		
Stereotactic radiosurgery (SRS) alone	7	
Surgical resection alone	4	
Whole Brain RT (WBRT) Alone		
2000 cGy/5 fractions	1	
3000 cGy/10 fractions	5	Some concern that WBRT would not sufficiently control renal cell carcinoma.
3750 cGy/15 fractions	5	Some concern that WBRT would not sufficiently control renal cell carcinoma.
4000 cGy/20 fractions	1	
Combination Therapy		
SRS + WBRT	8	
Surgery + WBRT	8	
Surgery + SRS to resection cavity	6	
Observation	1	
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Summary of Literature Review

Introduction/Background

Brain metastases represent the most common adult intracranial tumor. Treatment for patients with a single brain metastasis remains controversial given the number of management strategies available and the strong opinions associated with each option. Despite class I evidence suggestive of best therapy, there is no clear consensus regarding optimal treatment for these patients.

Prognostic Factors

Clinical factors have been evaluated to guide treatment decisions. The Radiation Therapy Oncology Group (RTOG®) Recursive Partitioning Analysis of three consecutive phase III brain metastases trials determined that the four most important factors were Karnofsky Performance Status (KPS), age, control of primary and status of extracranial disease. A more quantifiable scale, Graded Prognostic Assessment (GPA), from five phase III RTOG® trials demonstrated the importance of the number of lesions (1 vs 2-3 vs >3) in determining outcomes for patients with brain metastases. The GPA has been further refined for specific diagnoses of non-small-cell lung cancer, small-cell lung cancer, melanoma, renal cell

carcinoma, breast cancer, gastrointestinal cancer, and others.

Surgery

Advances in surgery and imaging have allowed for safer resection of brain metastases. If the patient is suffering from significant mass effect or has no pathologic confirmation of the primary, then surgical resection of the lesion, if feasible, is warranted. For patients with a single lesion who are relatively asymptomatic, the decision process is somewhat more complicated. The decision to use aggressive therapy depends on the extent and activity of extracranial disease and the number of brain lesions, as well as the patient's general medical condition, performance status, and preference. For patients with stable or absent extracranial disease, two randomized studies have clearly shown the benefit of surgical resection followed by whole brain radiotherapy (WBRT). The benefits are expressed not only in terms of freedom from neurologic progression but also in terms of overall survival. However, a third study failed to show a survival advantage with the addition of surgery, or an advantage in terms of quality-of-life. Thus, two of three randomized studies have shown a benefit of surgical resection and WBRT versus WBRT alone.

Whole Brain Radiation Therapy

The dose used with WBRT in patients with single brain metastasis is based mainly on studies performed in patients with multiple brain metastases. Prospective, randomized phase III clinical trials in patients with multiple brain metastases have included 1000 cGy in one fraction (1000/1), 1200/2, 1800/3, 2000/5, 3000/10, 3600/6, 4000/20, 5000/20, and 5440/34 (160 cGy twice a day [BID]). None of these regimens has proved superior in terms of survival or efficacy (about half of patients have an improvement in their neurologic symptoms). However, 3000 cGy in 10 fractions or 3750 cGy in 15 fractions represent the most frequently used dose/fractionation schedules. WBRT alone can provide excellent palliation for many patients with brain metastases. Most patients with radiosensitive histologies such as small-cell lung cancer, leukemia, lymphoma, and germ cell tumor can be managed with WBRT alone (see Variant 1 and Variant 2 above).

Surgery versus Stereotactic Radiosurgery (SRS)

Whether SRS is as effective as surgical resection has not been evaluated within a large phase III randomization trial for patients with single brain metastasis. A multi-institutional outcome study was performed on patients treated with radiosurgery and WBRT who met the same entry criteria as the patients treated in the two positive randomized trials of surgery and WBRT versus WBRT alone. The results of this non-randomized study indicate that radiosurgery plus WBRT produces the same local control, freedom from neurological deterioration, and overall survival as surgery plus WBRT. Another retrospective study showed improved median and 1-year survival for those undergoing surgery as compared to SRS. The rates of local recurrence and neurologic death were lower in the surgery group. Studies have suggested that the results of SRS and WBRT are equivalent to those of surgery and WBRT. For tumors >4 cm in greatest diameter or causing significant mass effect, surgery rather than SRS is the preferred treatment (see Variant 3 above).

Brachytherapy

Studies looking at stereotactic interstitial brachytherapy for patients with single lesions indicate that control rates are similar to those obtained with radiosurgery. However, brachytherapy is an invasive procedure and requires hospitalization. A phase II trial evaluating balloon brachytherapy demonstrated local control rates of 80% but higher rates of radiation necrosis. Given the invasive nature of brachytherapy, this approach is not routinely practiced.

Surgery with or without Whole Brain Radiation Therapy

The use of WBRT for patients with a single metastasis has been a subject of growing controversy. The question of whether surgical resection can be performed without the addition of WBRT was investigated in phase III randomized trials. These trials demonstrated an improvement in local and distant brain recurrence rates with the addition of WBRT, but no improvement in survival. Another study, however, was not powered to detect such a difference (see Variant 4 and Variant 5 above).

Stereotactic Radiosurgery with or without Whole Brain Radiation Therapy

The analogous question of whether radiosurgery can be performed without the addition of WBRT, has been studied in a phase III trial conducted in Japan randomizing patients with one to four brain metastases between radiosurgery and radiosurgery plus WBRT. This study demonstrated significantly improved local and distant brain control in the WBRT plus radiosurgery arm. Since the primary end point of the study was local control and not overall survival, it was not powered properly to evaluate survival differences.

Similar results were found in a phase III study of WBRT versus observation after radiosurgery or surgical resection for patients with one to three brain metastases. An intergroup phase III trial involving patients with one to three brain metastases comparing the results of SRS versus SRS followed by WBRT is ongoing (see Variant 6 above).

Whole Brain Radiation Therapy with or without Stereotactic Radiosurgery

Another question, whether patients receiving WBRT for a single brain metastasis benefit from the addition of radiosurgery, has been answered in an RTOG® randomized trial in patients with one to three brain metastases. In patients with a single brain metastasis, the addition of radiosurgery increased median survival from 4.9 months to 6.5 months (p=0.04). Local control was significantly improved for all patients. Based on the results of this trial, the RTOG® started a phase III trial (RTOG® 0320) for patients with non-small-cell lung cancer with one to three brain metastases, but it closed secondary to poor accrual (see Variant 7 above).

Neurocognitive Effect of Whole Brain Radiation Therapy

Concerns of neurocognitive deterioration from WBRT have received much attention and scrutiny. As part of a phase III trial evaluating the use of a novel radiation sensitizer with WBRT, all patients underwent evaluation of neurocognitive function using a battery of tests. Baseline neurocognitive testing demonstrated that 91% of patients had a significant decline in at least one domain prior to WBRT. Further analysis of the 208 patients in the WBRT arm of the study demonstrated WBRT-induced tumor shrinkage correlated with better survival and neurocognitive function. In addition, neurocognitive deterioration preceded quality-of-life declines, which suggests that strategies that delay neurocognitive decline appear worthwhile. Strategies including neuroprotective medications and hippocampal avoidance during WBRT are being investigated through the RTOG®. When Mini-Mental Status Examination (MMSE) was used to evaluate neurocognitive function as part of the phase III trial of SRS versus SRS plus WBRT for patients with one to four brain metastases, the omission of WBRT led to faster time to neurologic deterioration based on MMSE. In addition, the omission of WBRT significantly increased the risk for tumor recurrence and decline in neurologic function. A pilot study of neurocognitive function in patients with one to three brain metastases treated with SRS alone showed 60% of the patients had impairment at presentation. A recent phase III trial demonstrated worse neurocognitive outcomes at 4 months as measured by the Hopkins Verbal Learning Test (HVLT) for patients randomized to the WBRT and SRS arm versus hose in the SRS alone arm. Results from a phase III study showed no significant differences in global cognitive function (MMSE) or quality of life after prophylactic cranial irradiation, but there was a significant decline in memory (HVLT) at 1 year.

Stereotactic Radiosurgery to Resection Cavity

In an effort to avoid the potential toxicity of WBRT, the use of SRS to the resection cavity has also been investigated to aid in local control; however, published randomized trials are not available. Reports of SRS to the resection cavity are small in sample size, are retrospective, and use a wide range of SRS dosing and schedules. Rates of distant brain metastasis are similar to those in studies of surgery alone. A study of 106 patients treated with SRS to the resection cavity showed a 1-year local control rate of 80% with a 1-year distant brain failure rate of 64.6%. A study of 112 patients showed expansion of the resection cavity with a 2-mm margin to be associated with improved 1-year local control rates of 3% with expansion versus 16% without expansion. In this study, 54% of patients experienced distant brain failure at 1 year. Taken together, these studies show that approximately 2.8% to 3.6% of patients may require surgery for radiation-related toxicity. An ongoing intergroup phase III trial of adjuvant SRS versus WBRT for patients with one to four brain metastases that have been removed surgically is addressing this topic; the primary endpoints are overall survival and neurocognitive function.

Long Term Survival after Surgery or SRS

More aggressive treatment with surgery or SRS has led to greater number of patients being long-term survivors. A retrospective review of patients undergoing SRS reported that 6.5% survived at least 4 years. Another review of long-term survivors showed that 2.6% of patients in a large single institution database survived a minimum of 5 years.

Summary

- Compelling evidence suggests that aggressive local therapy for patients with a single brain metastasis is beneficial for survival and quality of life.
- If patients have no evidence of progressive extracranial disease, surgical resection or radiosurgery is appropriate therapy. While it appears that the addition of WBRT does not add to survival or duration of functional independence, it does reduce the risk of further intracranial failure and delays neurocognitive decline, particularly for those patients whose tumors have responded to WBRT.
- Recently completed and ongoing studies will help address the impact of WBRT on neurocognitive function and quality of life, which have been major reasons why WBRT is being omitted despite class I evidence supporting the use of WBRT after surgery or SRS.
- Since much controversy exists regarding optimal treatment for a patient with a single brain metastasis, patient participation in clinical trials is important to evaluate best treatment. For those patients who do not participate in clinical trials, the roles of surgery and SRS in improving outcomes for patients with a single lesion are evident.

Abbreviations

- CT, computed tomography
- KPS, Karnofsky Performance Status
- MRI, magnetic resonance imaging
- NSCLC, non-small cell lung cancer
- PET, positron-emission tomography
- RT, radiotherapy

Clinical Algorithm(s)

Algorithms were not developed from criteria guidelines.

Scope

Disease/Condition(s)

Single brain metastasis

Guideline Category

Treatment

Clinical Specialty

Neurological Surgery

Neurology

Oncology

Radiation Oncology

Radiology

Intended Users

Health Plans

Hospitals

Managed Care Organizations

Physicians

Utilization Management

Guideline Objective(s)

To evaluate the appropriateness of radiologic treatment procedures for patients with a single brain metastasis

Target Population

Patients with a single brain metastasis

Interventions and Practices Considered

1. Whole brain radiotherapy (WBRT) alone including dose
2. Focal therapy alone
    - Stereotactic radiosurgery (SRS)
    - Surgical resection
3. Combination therapy
    - SRS and WBRT
    - Surgery and WBRT
    - Surgery and SRS to resection cavity
4. Observation

Major Outcomes Considered

- Overall and median survival
- Local and distant recurrence rates
- Local control rate
- Neurocognitive function
- Quality of life

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Literature Search Procedure

The Medline literature search is based on keywords provided by the topic author. The two general classes of keywords are those related to the condition (e.g., ankle pain, fever) and those that describe the diagnostic or therapeutic intervention of interest (e.g., mammography, MRI).

The search terms and parameters are manipulated to produce the most relevant, current evidence to address the American College of Radiology Appropriateness Criteria (ACR AC) topic being reviewed or developed. Combining the clinical conditions and diagnostic modalities or therapeutic procedures narrows the search to be relevant to the topic. Exploding the term "diagnostic imaging" captures relevant results for diagnostic topics.

The following criteria/limits are used in the searches:

1. Articles that have abstracts available and are concerned with humans.
2. Restrict the search to the year prior to the last topic update or in some cases the author of the topic may specify which year range to use in the search. For new topics, the year range is restricted to the last 5 years unless the topic author provides other instructions.
3. May restrict the search to Adults only or Pediatrics only.
4. Articles consisting of only summaries or case reports are often excluded from final results.

The search strategy may be revised to improve the output as needed.

Number of Source Documents

The total number of source documents identified as the result of the literature search is not known.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Strength of Evidence Key

Category 1 - The conclusions of the study are valid and strongly supported by study design, analysis and results.

Category 2 - The conclusions of the study are likely valid, but study design does not permit certainty.

Category 3 - The conclusions of the study may be valid but the evidence supporting the conclusions is inconclusive or equivocal.

Category 4 - The conclusions of the study may not be valid because the evidence may not be reliable given the study design or analysis.

Methods Used to Analyze the Evidence

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

The topic author drafts or revises the narrative text summarizing the evidence found in the literature. American College of Radiology (ACR) staff draft an evidence table based on the analysis of the selected literature. These tables rate the strength of the evidence for all articles included in the narrative text.

The expert panel reviews the narrative text, evidence table, and the supporting literature for each of the topic-variant combinations and assigns an appropriateness rating for each procedure listed in the table. Each individual panel member forms his/her own opinion based on his/her interpretation of the available evidence.

More information about the evidence table development process can be found in the American College of Radiology (ACR) Appropriateness Criteria® Evidence Table Development document (see the "Availability of Companion Documents" field).

Methods Used to Formulate the Recommendations

Expert Consensus (Delphi)

Description of Methods Used to Formulate the Recommendations

Modified Delphi Technique

The appropriateness ratings for each of the procedures included in the Appropriateness Criteria topics are determined using a modified Delphi methodology. A series of surveys are conducted to elicit each panelist's expert interpretation of the evidence, based on the available data, regarding the appropriateness of an imaging or therapeutic procedure for a specific clinical scenario. American College of Radiology (ACR) staff distributes surveys to the panelists along with the evidence table and narrative. Each panelist interprets the available evidence and rates each procedure. The surveys are completed by panelists without consulting other panelists. The ratings are a scale between 1 and 9, which is further divided into three categories: 1, 2, or 3 is defined as "usually not appropriate"; 4, 5, or 6 is defined as "may be appropriate"; and 7, 8, or 9 is defined as "usually appropriate." Each panel member assigns one rating for each procedure per survey round. The surveys are collected and the results are tabulated, de-identified and redistributed after each round. A maximum of three rounds are conducted. The modified Delphi technique enables each panelist to express individual interpretations of the evidence and his or her expert opinion without excessive bias from fellow panelists in a simple, standardized and economical process.

Consensus among the panel members must be achieved to determine the final rating for each procedure. Consensus is defined as eighty percent (80%) agreement within a rating category. The final rating is determined by the median of all the ratings once consensus has been reached. Up to three rating rounds are conducted to achieve consensus.

If consensus is not reached, the panel is convened by conference call. The strengths and weaknesses of each imaging procedure that has not reached consensus are discussed and a final rating is proposed. If the panelists on the call agree, the rating is accepted as the panel's consensus. The document is circulated to all the panelists to make the final determination. If consensus cannot be reached on the call or when the document is circulated, "No consensus" appears in the rating column and the reasons for this decision are added to the comment sections.

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The recommendations are based on analysis of the current literature and expert panel consensus.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Selection of appropriate radiologic treatment procedures for patients with a single brain metastasis

Potential Harms

- Studies show that approximately 2.8% to 3.6% of patients may require surgery for radiation-related toxicity.
- Complications of stereotactic radiosurgery (SRS)

Qualifying Statements

Qualifying Statements

The American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those examinations

generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

IOM Domain

Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

Vassil AD, Videtic GMM, Gore EM, Bradley JD, Buatti JM, Germano I, Ghafoori AP, Henderson MA, Lutz ST, Murad GJA, Patchell RA, Patel SH, Robbins JR, Robins HI, Wippold FJ II, Yunes MJ, Expert Panel on Radiation Oncology-Brain Metastasis. ACR Appropriateness CriteriaÂ® single brain metastasis. [online publication]. Reston (VA): American College of Radiology (ACR); 2012. 9 p. [37 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

1999 (revised 2012)

Guideline Developer(s)

American College of Radiology - Medical Specialty Society

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Guideline Committee

Committee on Appropriateness Criteria, Expert Panel on Radiation Oncology–Brain Metastases

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Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

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Guideline Availability

Electronic copies: Available from the American College of Radiology (ACR) Web site.

Print copies: Available from the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

Availability of Companion Documents

The following are available:

- ACR Appropriateness Criteria®. Overview. Reston (VA): American College of Radiology; 2 p. Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.
- ACR Appropriateness Criteria®. Literature search process. Reston (VA): American College of Radiology; 1 p. Electronic copies: Available in PDF from the ACR Web site.
- ACR Appropriateness Criteria®. Evidence table development – diagnostic studies. Reston (VA): American College of Radiology; 2013 Nov. 3 p. Electronic copies: Available in PDF from the ACR Web site.
- ACR Appropriateness Criteria®. Evidence table development – therapeutic studies. Reston (VA): American College of Radiology; 2013 Nov. 4 p. Electronic copies: Available in PDF from the ACR Web site.
- ACR Appropriateness Criteria® single brain metastasis. Evidence table. Reston (VA): American College of Radiology; 2012. 11 p. Electronic copies: Available from the ACR Web site.

Patient Resources

None available

NGC Status

This summary was completed by ECRI on January 30, 2001. The information was verified by the guideline developer as of February 20, 2001. This NGC summary was updated by ECRI on August 17, 2006, December 22, 2010, and on May 22, 2013.

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